Forest Health Protection
Pacific Southwest Region

Date: August 19, 2016
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To: Eduardo Olmedo, Grindstone District Ranger

Subject: Follow-up report for the Four Beetles (aka Beetle Trough) Project

At the requests of Tony Saba, Silviculturist (Mendocino NF), the original site visit made to the Four Beetles (aka Beetle Trough) Project along the M2 road in the Tatham and Trough Ridge area of the Grindstone Ranger District, Mendocino National Forest on July 13, 2015. The objective was to assess the current stand conditions, evaluate the project for potential funding through the Forest Health Protection (FHP) Western Bark Beetle Initiative. Follow-up visits have been made, including the latest on May 17, 2016.

Background

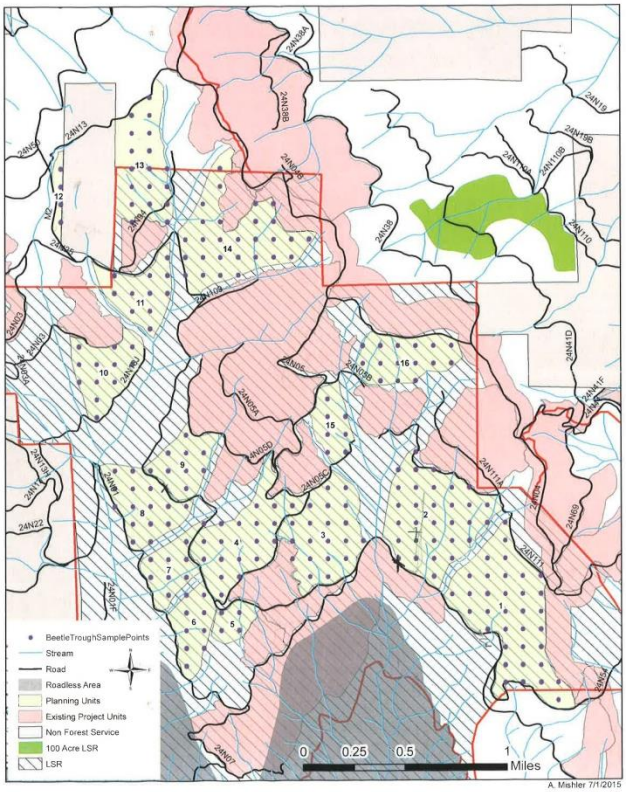

Figure 1. Beetle Trough Project (in light green) location in association with Tatham Ridge Project (in red). All areas with cross-hatching are within Buttermilk LSR.

The Four Beetles Project area is located within the general area of the Tatham Ridge Fuelbreak Project of 2011 (Figure 1) within and adjacent to the Buttermilk LSR, approximately eight miles west of Paskenta (T24N, R8W, sec. 13-16, 21-24, 25-28, and 34-36, Mt. Diablo Meridian, average elev. 5,300 ft.).

NEPA is in the initial phases on the project with expected completion in FY2017. Fire suppression and logging are largely responsible for creating the present day forests in and around the project area. Plantations in the area are over-stocked with healthy conifers but also include substantial volumes of competing vegetation including live and black oak. Current density and levels of competing vegetation increases vulnerability to both fire and insect-caused mortality.

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Observations

There were two types of stands visited in the Four Beetles area. Stands within the lower elevations of the project area were predominantly natural stands of ponderosa pine (*Pinus ponderosa*), the primary component of large overstory trees (20" DBH and greater), found in combination with scattered incense cedar (*Calocedrus decurrrens*), Douglas-fir (*Pseudotsuga menziesii*) and sugar pine (*Pinus lambertiana*). Hardwoods, such as black oak (*Quercus kelloggii*) are common in these areas. Stands ranged from being uniformly dense to clumpy with small scattered openings, with diameters between 4 and 24+ inches. The understory was dense with live oak. Stands in the upper elevations were primarily mature white fir (*Abies concolor*) with several legacy ponderosa pine scattered throughout (Figures 2 and 3). The understory was mostly park-like but dominated by white fir saplings.

Figure 2. Clumpy distribution of ponderosa pine at mid-elevations along M2 road in Beetle Trough area.

Figure 3. Large white fir with scattered legacy ponderosa pine in upper elevations in Beetle Trough area. Silviculturist standing next to pine for scale.

Most of the proposed stands are at or exceeded 60% maximum stand density index (SDI). The measurement of SDI is used to relate stand density to the biological carrying capacity of a stand. Barring disturbance, stand density increases over time as trees grow increasingly larger. For most species, as stands reach and exceed densities of 60% of a maximum SDI, density related tree mortality becomes increasingly evident. An SDI of 365 is considered limiting for ponderosa pine due to increased risk of bark beetle-caused mortality. As ponderosa pine-dominated stands reach and exceed an SDI of 230 (roughly 60% of the SDI of 365) bark beetle-caused mortality is increasingly likely.

Pockets of recent and ongoing mortality in ponderosa pine are occurring in numerous stands throughout the lower elevations of the project area as a result of western pine beetle (*Dendroctonus brevicomis*). Mortality pockets that averaged 10 – 25 trees in size in 2015 (Figure 4) have increased in size. Western dwarf mistletoe (*Arceuthobium campylopodum*) was common, especially on pine regeneration but not excessively heavy

Figure 4. Western pine beetle-caused mortality in ponderosa pine extends across Trough and Tatham Ridges.

in the overstory (Figure 5). Dwarf mistletoe adds an additional stress on the trees by parasitizing water and nutrients from the host. Heterobasidion root disease in white fir (*Heterobasidion occidentale*) was confirmed in one of the upper elevation stands (Figure 6).

2014 Aerial survey detected over 1,000 acres with elevated mortality in the area. The area was also highly impacted by bark beetles in 2013.

Figures 5 and 6. Western dwarf mistletoe (on the left) in ponderosa pine, and suspected root disease center (on the right) in white fir.

The visit on May 17, 2016 provided a view of the continued mortality in the area. The pockets of tree mortality were increasing in size and new pockets were continuing to develop in numerous stands throughout the lower elevations of the project area as a result of western pine beetle. The situation is continuing to worsen, similarly to the mortality event that occurred in the M-9 Project area over the past 4-5 years as the drought continued to intensify over the Mendocino NF.

Discussion

Thinning in this area in such a way as to meet the minimum requirements for western bark beetle funding is supported by the FHP staff through this evaluation. Desired conditions would include reducing density to a level that would remain less than 60% of maximum SDI for a minimum of 20 years to avoid re-entry in that time frame. This would include thinning across all diameters leaving the best of the best of a variety of species including sugar pine, Douglas fir, and incense cedar where available.

The area is at risk of losing 6-24% total basal area due to insects and disease according to the 2012 Risk Map. If thinned across all diameters, the Four Beetles Project would fit well with Western Bark Beetle Initiative guidelines to reduce risk of bark beetle-caused mortality and would be supported by FHP. The most current precipitation data from the Department of Water Resources indicates that the Mendocino NF area is at above normal precipitation for the 2016 water year. The current visible tree mortality is mostly from the previous year starting to turn red and the trees that have been unable to fully recover due to overstocking.

Western dwarf mistletoe, although present, does not seem to pose a risk for stands at this time. Thinning may include sanitation to remove brooms when located to further reduce risk of further spread. Thinning should incorporate prioritizing tree species and diameter classes to increase diversity, which may slow the spread of insects and disease. Heterobasidion root disease, if confirmed at the upper elevations in white fir, may be treated as a natural thinning agent in the white fir and application of a borate compound would be at the discretion of the line officer.

If you have any questions regarding this report and/or need additional information, please contact Cynthia Snyder at 530-226-2437 or Pete Angwin at 530-226-2436.

/s/ Cynthia Snyder

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CC: Tony Saba, Andrew Mishler, Lauren Johnson, Sheri Smith, Chris Fischer, Sherry Hazlehurst, and Phil Cannon